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DIONIC® HCX

Lithium Ion Digital Battery Owner's Manual

INTERACTIVE BATTERY SYSTEM

A7595-0378 Rev C

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IMPORTANT:
READ AND UNDERSTAND THIS MANUAL BEFORE OPERATION

The DIONIC® HCX battery lithium ion chemistry delivers a higher power to weight ratio than NiCd & NiMH. However, all lithium ion batteries have more sensitive charging and discharging parameters and require longer charge times (2-5 hours). **See charging section page 2 for more details.**

The DIONIC® HCX battery is specifically designed to be charged with current InterActive® chargers. Older model InterActive MP4D, Quad, Lifesaver Dual, and ABC800 cannot charge these batteries.

Do not attempt to charge this battery on non InterActive chargers or chargers not manufactured by Anton/Bauer.

Special safety circuits in the DIONIC® HCX battery will prevent charging on ANY charger which cannot properly address battery communications.

Because of its lithium ion chemistry, the DIONIC® HCX battery is unlike other video batteries you may have used. Special precautions and handling instructions are contained in this manual and should be strictly adhered to for safe and reliable operation. **Contact Anton/Bauer Customer Support at (203) 925-4991 or support@antonbauer.com with any questions regarding this product.**

INTRODUCTION

The development of the DIONIC® HCX battery system has been made possible through the incorporation of the InterActive technology of the Anton/Bauer Digital system with the very latest lithium ion cell formulations. Each DIONIC® HCX battery features an on-board "fuel computer" to monitor energy put into and taken out of the battery, as well as critical operating characteristics and conditions. This data is communicated to the InterActive charger to optimize safe and reliable performance.

In addition, remaining battery capacity information is available to the operator by means of a RealTime™ LCD on each battery and in the viewfinder of most broadcast and professional camcorders. The patented interface from the Digital battery to the camera viewfinder is factory standard equipment on most camera/camcorder models from all camera manufacturers.

Anton/Bauer InterActive® chargers were designed in anticipation of new cell technologies, so chargers in the field require only a single chip update to effectively address this new battery system, as well as the standard HyTRON™, and TrimPac® battery products. This upward and downward compatibility uniquely allows Anton/Bauer to introduce new high performance cell technologies, such as the DIONIC® HCX, safely and seamlessly into existing battery inventories.

The new DIONIC® HCX battery will automatically identify itself to the InterActive charger, activating the specialized charge routines necessary to effectively utilize this new technology.

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FEATURES

1. **Microprocessor Fuel Computer** - Accurately monitors the energy in the battery with programs that take into account battery age, self discharge, charge/discharge rate, operating conditions, and previously experienced charge/discharge cycles. The DIONIC® HCX battery constantly "learns" its precise state of charge and remaining capacity. This data is automatically transmitted to an InterActive charger.

2. **Integral RealTime™ 'LCD' –** This new and exclusive Anton/Bauer feature displays both the remaining runtime and the percentage of remaining battery capacity at all times - *simultaneously*. No special adapters or set up is required. (see complete explanation on page 3)

3. **Viewfinder Fuel Gauge Display** - Cameras which include the Anton/Bauer InterActive viewfinder feature connect with the DIONIC® HCX battery "Fuel Computer" to display an accurate "Fuel Gauge" of remaining battery capacity in the viewfinder. Reference your camera/camcorders owner's manual for proper menu settings.

4. **Impac® Case design** - High impact case construction protects the cells from impact that would damage or destroy conventional batteries.

5. **Gold Mount® Interface** - Patented worldwide standard Gold Mount connector is compatible with all Anton/Bauer camera mounts and accessories.

6. **Individual Computer Testing –** As with all Anton/Bauer batteries, each and every DIONIC® HCX battery is individually tested to assure optimum capacity, voltage and overall quality. A serialized computer performance graph is included with this battery as confirmation of this testing.

7. **Deep Sleep Motion Sensor –** The DIONIC® HCX incorporates a "Deep Sleep" feature that minimizes the self discharge rate of the battery when it is inactive and stored for a period of time when not on a charger. (Factory default: 2 days) When the battery is needed again, the battery electronics automatically "wake up" when triggered by a motion sensor that is activated when the battery is picked up, placed on a charger, or subjected to a load.

CHARGING DIONIC® HCX BATTERIES

- DO NOT ATTEMPT TO CHARGE THIS BATTERY WITH ANY CHARGER OTHER THAN THE ANTON/BAUER InterActive® OR T SERIES® CHARGERS SPECIFIED IN THIS MANUAL.

- **Allow the battery to reach a steady green (LifeSaver®) mode before using for the first time. Please read the individual charger Owner's Manual to become acquainted with the many unique operating features of the chargers.**

- The DIONIC® HCX battery will be approximately 90% charged when the LED's on the charger indicate FLASHING GREEN. The battery is 100% charged when the charger indicates STEADY GREEN. The DIONIC®HCX battery may be removed from the charger and discharged in either condition.

- **The DIONIC® HCX battery can remain on the charger until just prior to being used.** The LifeSaver (STEADY GREEN charger LED indication) maintenance routine keeps the battery charged and ready for use. If the battery will not be used for an extended period (more than 14 days) see "Operating Guidelines" on page 4.

  For best results this battery should be used or returned to the InterActive® or T Series® charger within 48 hours of being used.

Note: On some older chargers it may be necessary to install the battery on the charger, wait one (1) minute, then remove the battery and re-install. This procedure may need to be repeated more than once to "wake up" a low voltage battery.

NOMINAL CHARGE TIMES FOR DIONIC® HCX

Charge Level LED Indicators	90% Flashing Green	100% Steady Green
DUAL 2722 (2 batteries simultaneously)	3 hrs.	4 hrs.
InterActive® PowerCharger® (QUAD/DUAL – 2702/2701/2700) (QUAD/DUAL – 2401/2400) (2 or 4 batteries sequentially)	3 hrs.	4 hrs.
T2 (2 batteries simultaneously)	3 hrs.	4 hrs.
Tandem 70	3 hrs.	4 hrs.
TWIN (2 batteries simultaneously)	6 ½ hrs.	7 ½ hrs.
TWQ (4 batteries simultaneously)	6 ½ hrs.	7 ½ hrs.
TM-4 (4 batteries simultaneously)	3 hrs.	4 hrs.

Charge time can vary depending on age, condition and remaining capacity of each battery at the time it is placed on the charger.

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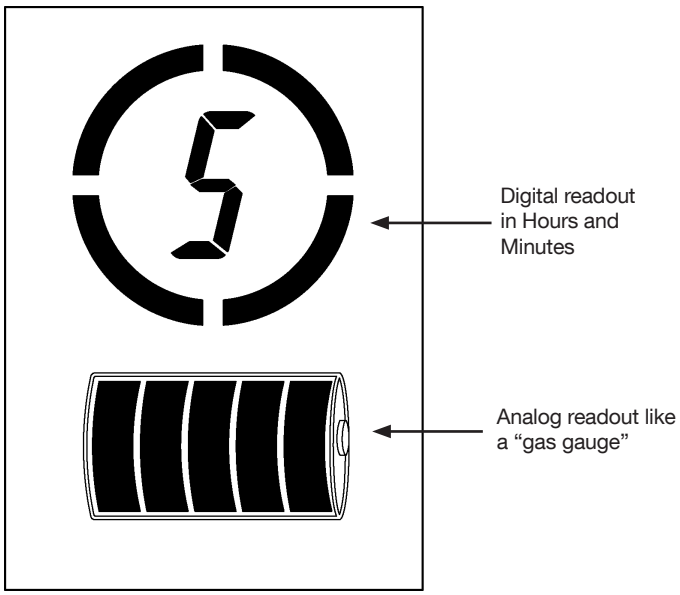
BATTERY AND DISPLAY

The DIONIC® HCX features an all NEW "RealTime™" LCD providing on-the-fly remaining run time estimates in 15 minute increments as well as *simultaneously* providing remaining capacity information using the traditional "Fuel Gauge" approach. No special adapter or set up is required. RealTime™ *automatically calculates the load and displays capacity information and battery status at all times.*
Special electronics protect the lithium ion cells in the DIONIC® HCX battery from damage and to ensure safe operation. These electronics work in conjunction with the Digital Battery electronics and will give the operator additional indications in the RealTime™ display of the battery's status as outlined below.



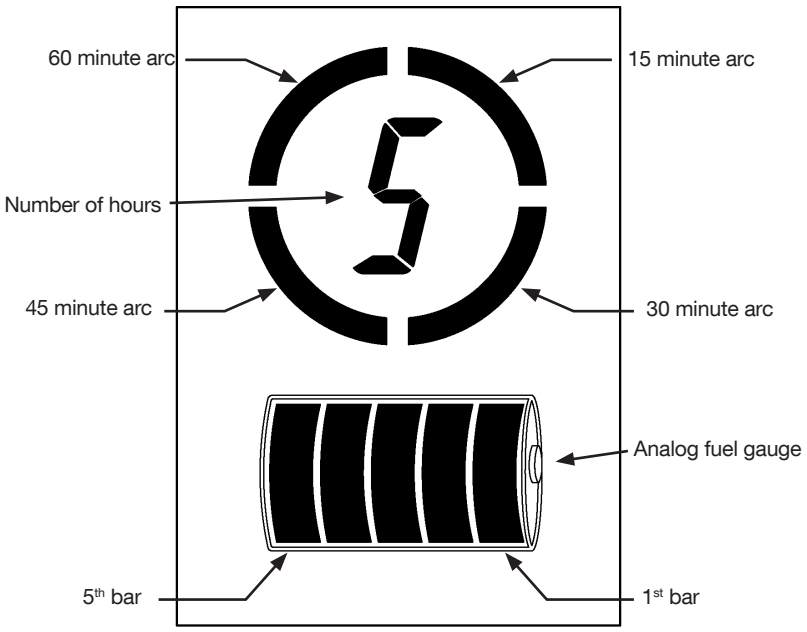
The RealTime™ LCD provides on-the-fly remaining run time estimates in 15 minute increments as well as providing remaining capacity information using the traditional "gas gauge" approach. In this way, the LCD provides two different methods of determining battery capacity.

The following is a description of the features of the remaining run time LCD:

1. The remaining run time is calculated using the present available capacity and a measure of the present power load.
2. If no load has been detected, or if the battery is coming off a charger, the default assumed power for remaining runtime calculations is 20 watts.
3. When the battery determines that a load is attached, the default 20 watt load will be abandoned and a new remaining run time will be calculated based on the new load presented to the battery.
4. The battery will "learn" this new load and retain that load information in non-volatile memory.
5. If the battery is removed from a load and placed on a shelf for extended periods, the remaining run time calculation will continue to use the learned load value for up to 30 minutes.
6. After 30 minutes, the remaining run time calculation will again use the default 20 watt load as criteria.
7. When the battery has reached its learned capacity EOD (end of discharge) voltage level (12.7 VDC), the LCD will begin flashing the 15 minute icon until the battery is returned to a charger.
8. If the battery reaches an EOD condition (12.4 VDC), the LCD's last fuel gauge segment will be the only remaining icon flashing until the battery is returned to a charger.
9. If the battery voltage drops below the Fuel Gauge cut out circuit voltage (10.0 to 10.8 VDC) the Fuel Gauge will be disabled and the LCD will go blank until the battery is returned to a charger.

I. ANALOG FUEL GUAGE

LCD Segments	% Capacity
1st Bar, 2nd Bar, 3rd Bar, 4th Bar, 5th Bar	100
2nd Bar, 3rd Bar, 4th Bar, 5th Bar	80
3rd Bar, 4th Bar, 5th Bar	60
4th Bar, 5th Bar	40
5th Bar	20
5th Bar flashing	EOD (12.4 Vdc)



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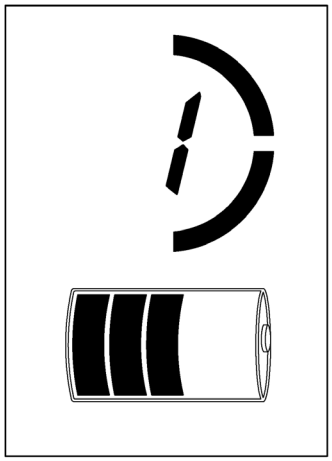
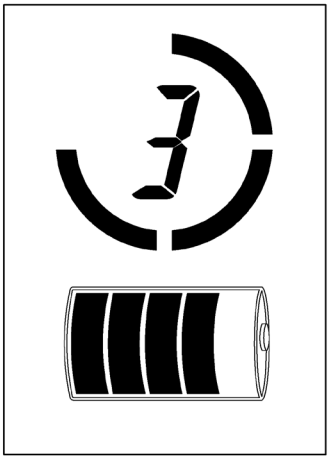
BATTERY AND DISPLAY (continued)

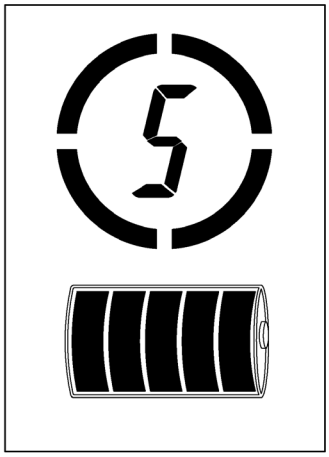
II. REMAINING RUN-TIME GAUGE



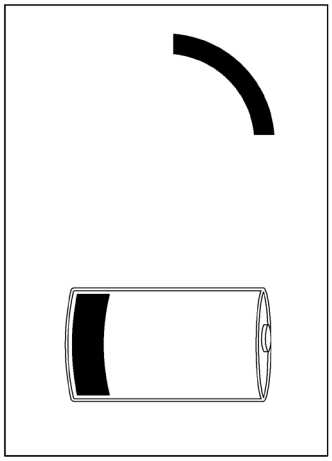
1 hr. 30 mins. 60% capacity remaining



3 hrs. 45 mins. 80% capacity remaining



6 hrs. 100% capacity remaining



≤ 15 mins. ≤ 20% capacity remaining

LCD Segments	Remaining Run Time
1 flashing arc	Learned Capacity Level Reached (12.7 Vdc)

OPERATING GUIDELINES

1. Keep batteries cool or at room temperatures whenever possible. Sustained elevated temperatures are the primary reason for premature failure of batteries:
   a. Charging - Charge batteries at room temperature. In warm climate keep chargers in air conditioned rooms for best performance.
   b. On assignment - Do not leave batteries in a hot vehicle trunk or out in direct sunlight.
   c. Although lithium ion has good self-discharge characteristics, long term storage in a fully charged condition will result in irreversible capacity loss. This is a problem for all lithium ion batteries – from cell phones to video cameras. Use the battery; do not store it for extended periods.
   d. Batteries should always be stored in a charged state and kept cool. If batteries must be stored for a long period (over 14 days), the battery electronics will enter a "deep sleep" mode, "wake-up" when the battery is picked up, (thus activating its internal motion sensor) subjected to a load, or placed on a charger. It is always a good idea to submit the battery to a discharge/charge cycle from time to time during storage.

2. **Do not over-discharge batteries** - It is quite proper to discharge a battery until a low voltage warning in the camera or VTR is observed. However, a switch to a fresh battery should occur as soon as possible following such indication. Never leave a battery operated device unattended while it is running.

3. **DO NOT LEAVE A BATTERY ATTACHED TO A CAMERA/CAMCORDER during transit or storage.** "Keep warm" circuitry in the camera can drain the battery, because the DIONIC® HC battery has specialized circuits which will not allow a battery to over discharge, the battery will protect itself and shut down.

4. Low voltage batteries can also be caused by allowing batteries to remain off the charger for extended periods causing the LCD display to be blank, indicating that the electronic circuitry has removed all load from the battery cells – including the display. In the case that the battery is in a low voltage condition the battery should be returned to the charger. The charge routine will not be initiated by the charger until all other batteries have completed their fast charge routines. Therefore, a low voltage battery can be installed on an InterActive charger without the charger indicating recognition. The battery should remain on the charger until charging is complete. It may be helpful to remove other batteries before placing a battery with a blank display on the charger. If the battery display goes from blank to flashing, remove from charger and reinstall. If flashing display condition remains, contact customer support.

5. Never leave any battery unattended on equipment.

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OPERATING GUIDELINE

6. Routine use of a battery at discharge rates greater than the battery rating (e.g. 150 watts maximum, 75 watts or less for lighting load) can reduce overall service life. Always select the proper size battery for your application.

7. Discharging the battery for diagnostic purposes should only be performed on an occasional basis (once every 6-8 weeks at most). Unnecessary discharging only detracts from overall life.

8. Periodic cleaning of both the charger terminals and battery terminals will ensure continued reliable operation. Clean the terminals occasionally with a pencil eraser or lightly scrape the surface with a blunt instrument to help reduce this possibility.

Anton/Bauer publishes a comprehensive "Video Battery Handbook" to help you further understand the care and use of video batteries. This guide is available at no charge by contacting Anton/Bauer at 1-800-422-3473 or 203-929-1100 or fax 203-929-9935. It can also be downloaded from the web at www.antonbauer.com.

SERVICE

In the event a DIONIC®HCX battery fails to deliver acceptable performance, it must be returned to the Anton/Bauer. No other facility is qualified and equipped to service the DIONIC®HC batteries and calibrate the electronic components and sensors. Any attempt by the user or any other unauthorized persons to service this battery will surely result in improper calibration of the electronic components **resulting in severe battery damage and/or safety hazards,** including potential personal injury and/or damage to property. Any such attempt will void any/all warranties.

WARNING

1. **NEVER** attempt to service this battery. If there is a problem, send this battery only to Anton/Bauer for evaluation.

2. **NEVER ATTEMPT TO OPEN THIS BATTERY**. The electronic circuits inside the battery can be damaged causing malfunction and/or potential hazard to person and property.

3. **NEVER** attempt to replace the cells in this battery – it cannot be rebuilt or serviced. At the end of its useful life contact the Anton/Bauer Customer Support Group at support@antonbauer.com or (800) 541-1667 or (203) 925-4991.

PRECAUTIONS

1. **Do not expose this battery to high temperatures (above 50°C/120°F). This includes storage in direct sunlight , in cars in hot weather, or in close proximity to heating devices. This may cause electrolyte leakage, impaired performance and shortening of battery service life.**

2. **When not using the battery for prolonged periods, the DIONIC HC battery should be charged.**

3. **ALL LITHIUM ION BATTERIES have a finite life. If the battery exhibits noticeably shortened run time the battery should be replaced immediately. Shortened runtime is indicative of at least one cell which has reached end of life. UNDER NO CIRCUMSTANCES should one attempt to "recondition" this battery by repeated charging and discharging.**

4. **This battery contains specialized electronic circuits, which are designed to protect the lithium ion cells from overcharge, overdischarge and overcurrent. Redundant protection devices are designed to operate if the battery voltage is abnormally high or low and if the temperature of the battery exceeds operating specifications. These electronic devices can be damaged if the battery is subject to abuse or damage. Do not use a battery that has been subjected to excessive mechanical shock or water damage.**

5. **Do not drop, puncture or crush this battery. Do not use the battery if the case is damaged or broken. Do not open or attempt to service this battery if damaged.**

DIONIC® HCX BATTERY SPECIFICATIONS

OUTPUT VOLTAGE	14.4v Nominal 12.4 ~ 16.8VDC Operating
CAPACITY	118 WH Typical
FUSE	Internal 10amp
RECOMMENDED OPERATION *(MAXIMUM DISCHARGE RATE)*	50-100 watts *(150 watts)*[1]
TYPICAL RUN-TIME	@ 20w - 6 hrs. @ 25w – 4 ¾ hrs. @ 40w – 3 hrs.
WEIGHT	2.4 lbs
SIZE	5.47 x 4.06 x 3.00
CHARGE TEMPERATURE	0 – 40°C
DISCHARGE TEMPERATURE	-20 – 60°C
STORAGE TEMPERATURE	-20 – 50°C

[1] Routine use of a battery at discharge rates greater than the recommended operating range can reduce overall service life. Always select the proper size battery for your application.

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LIMITED WARRANTY

This warranty for the battery product specified in this document ("Product") is given by Anton/Bauer, Inc. ("Anton/Bauer"), 14 Progress Drive, Shelton, Connecticut 06484. If you (the purchaser of the Product from Anton/Bauer, or the person for whom the Product was purchased, if it was a gift) have any questions regarding Product applications, Product specification, or to obtain warranty service on this or any Anton/Bauer product, contact the company at the address above.

THIS PRODUCT MUST BE REGISTERED WITH ANTON/BAUER WITHIN 30 DAYS OF PURCHASE TO ASSURE WARRANTY COVERAGE. TO REGISTER YOU MAY EITHER:

(1) MAIL WARRANTY REGISTRATION CARD or
(2) REGISTER ON LINE AT www.antonbauer.com

Warranty registration, including the serial numbers of Anton/Bauer chargers used with this battery, must be supplied to Anton/Bauer. Anton/Bauer will warranty the Product only against defects in material and workmanship for the period as follows from the date of purchase, in accordance with the terms set forth below, and then, only if the Product is used exclusively in conjunction with compatible Anton/Bauer chargers. If this battery is returned to Anton/Bauer for warranty service it will be required that you provide model names and serial numbers of compatible Anton/Bauer chargers with which this product was used.

MAXX II WARRANTY
0-24 MONTHS: Anton/Bauer will repair or replace the Product at Anton/Bauer's option and cost.

This warranty shall be effective only if Anton/Bauer receives notice of such defects in materials or workmanship during the period of the warranty. Minimum battery capacity is defined under this warranty as 60% of nominal specified capacity for this Product at time of purchase.

The liability of Anton/Bauer hereunder is expressly limited to a claim for repair or replacement of the Product or as otherwise stated herein at Anton/Bauer's sole discretion. Notice of any claim under this warranty shall be delivered to Anton/Bauer during the period of the warranty and the Product shall be returned with its packaging promptly, at your expense, to an Anton/Bauer Customer Support Center or to the address above. Upon receipt of the Product and a record of your compliance with the conditions of this warranty, Anton/Bauer will repair or replace the Product and return it to you, or issue a credit, as applicable. You are responsible for all shipping and handling charges to and from authorized facility.

THIS WARRANTY DOES NOT APPLY TO AND IS VOID IN THE CASE OF DEFECTS OR DAMAGE RESULTING FROM ACCIDENTS, DISASTER, NEGLECT, MISUSE, IMPROPER INSTALLATION, IMPROPER OR UNAUTHORIZED SERVICE OR MAINTENANCE, UNAUTHORIZED REPLACEMENT PARTS OR ATTACHMENTS; OR DYSFUNCTION OR MALFUNCTION OF, OR CAUSED BY, ANY OTHER PRODUCT OR DEVICE. **Misuse includes any use of the Product in other than its intended application, including the use of this Product with any charging device or accessory not manufactured by and/or specified by Anton/Bauer. This warranty does not cover, and Anton/Bauer assumes no responsibility for, any equipment or devices used in conjunction with the Product.**

ANTON/BAUER DISCLAIMS ANY LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR BREACH OF ANY WRITTEN OR IMPLIED WARRANTY OF THE PRODUCT. UNDER NO CIRCUMSTANCES WILL ANTON/BAUER BE RESPONSIBLE FOR ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES.

This Warranty is to be construed and enforced in accordance with the law of the State of Connecticut, including the provisions of the Uniform Commercial Code as adopted and from time to time amended in the State of Connecticut, and not the Convention for the International Sale of Goods. This choice of Connecticut law is exclusive of any Connecticut law that would require reliance on any law foreign to Connecticut. Should any action of law or in equity be brought by any person under this Warranty, such action shall be brought only in the United States District Court for the District of Connecticut, or in any Superior Court in Fairfield County, Connecticut, USA. Some states do not allow limitations on how long a warranty lasts, so the time period limitation herein may not apply to you. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights and you may have other legal rights which may vary from state to state.

Use of unauthorized equipment in conjunction with Anton/Bauer products constitutes misuse under our warranties and may limit or void those warranties. Anton/Bauer does not authorize, condone, recommend, or otherwise assume any liability or responsibility resulting from the use of any battery, charger or accessory made by Anton/Bauer manufacture with any battery, charger or accessory not manufactured, produced or sold by Anton/Bauer. Anton/Bauer only authorizes the use of original Anton/Bauer product with this product. Use only original Anton/Bauer equipment with this product.

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AIR TRANSPORTATION REGULATION

DOT Dangerous Goods Regulations 49CFR Parts 100-185, International Air Transport Association (IATA) and the International Civil Aviation Organization (ICAO) rules apply to all lithium ion battery transport.

AIR TRANSPORTATION DECLARATION

Anton/Bauer, Inc. declares that the DIONIC® HCX lithium ion battery pack contains equivalent lithium content (ELC) in a quantity exceeding 8 grams and less than 25 grams and therefore is considered and must be handled and transported as a class 9 Hazardous article and is subject to regulation under Dangerous Good Regulations 49 CFR parts 100-185.

Since the interpretation and application of regulations may vary with the aviation company, the transport of the DIONIC® HCX may be disallowed even when the conditions described above are satisfied. Anton/Bauer therefore strongly recommends that you consult with your transportation company prior to transporting the battery pack.

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